



CAIN BOLT & GASKET, INC

CAIN BOLT & GASKET TECHNICAL MANUAL

7724 7th Avenue South, Seattle, WA 98108

Phone: 206.763.6460 **Fax:** 206.763.6878

info@cainboltandgasket.com

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***DISCLAIMER: Properties and application parameters shown in this manual are presented in good faith but no warranty is expressed or implied. Failure to properly use gasket material could result in serious injury or death.**



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PHONE: (206)763-6460 * FAX: (206) 763-6878

*** DOMESTIC & IMPORT INVENTORIES ***

*** FLANGE BOLT & GASKET KITS ***

*** METRIC FASTENERS AVAILABLE ***

FASTENER PRODUCTS

PLAIN, ZINC PLATED, CAD PLATED, MILD STEEL, STAINLESS, GRADE 5 & 8

* BOLTS *	* NUTS *	* WASHERS *	* SPECS *	* SPECIALS *
HEX HEAD	FINISHED HEX	USS	B7 / L7	U- BOLTS
STAINLESS STEEL	HEAVY HEX	SAE	A307A & B	J- BOLTS
ANCHOR	COUPLING	HARD	B8 / B8M	LOW CARBON
STUDS	LOCKING NUTS	BEVEL	GR 5	STRUCTURAL
BENT BOLTS	ALL GRADES	LOAD	GR 8	ALLOYS
SOCKETS	STRUT	LOCK	A325	STAINLESS STEEL
SPECIALS		FENDER	A36	EXOTICS
STRUCTURALS		SQUARE	304SS	ANCHOR BOLTS
FLANGE BOLT KITS		PLATE	316SS	ALL THREAD

GASKETS & GASKETING MATERIALS

ELASTOMERIC, NON-ASBESTOS, HIGH TEMPERATURE, FDA APPROVED

* GASKETS & CUT PARTS *	* SHEET GOODS *	* FLANGE INSULATION*
IN - HOUSE MANUFACTURING	RUBBER	TEXTILES
DIE MAKING	SPONGE	CORK
SPECIAL GASKETS	PLASTICS	GRAPHOIL
CUSTOM PARTS	FELT	EXOTICS
HEADS/ PUMPS	HIGH-TEMP	TEFLON
HEAT EXCHANGER/ VALVES	GARLOCK	NON-ASBESTOS
CYLINDERS		
METAL GASKETS		
		SLEEVING
		INSULATING WASHERS
		ONE PIECE KITS
		TYPE "F" & TYPE "E"
		PHENOLIC
		NEMA

PIPE PENETRATION SEALS

INNERLYNX

EXPANSION JOINTS

METAL * FABRIC * COUPLINGS * CONNECTORS

API, ASTM, ANSI, AWWA, FEDERAL & MILITARY SPECS

*** CALL 24 HOURS A DAY, 7 DAYS A WEEK ***

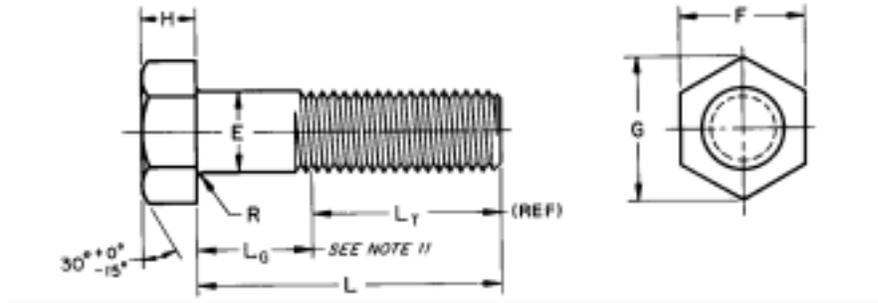
(206) 763-6460

ASK ABOUT OUR DELIVERY SERVICE & "KIT" PACKAGING

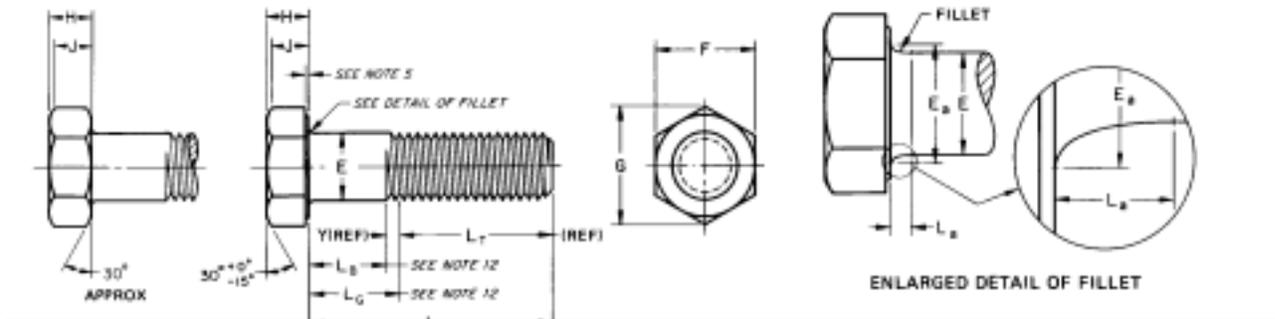


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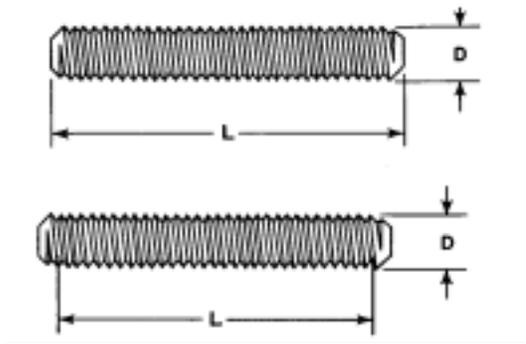
HEX BOLT



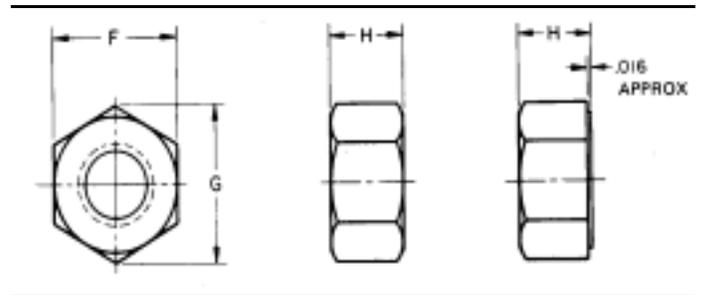
CAP SCREW



ALL THREAD STUDS



NUTS



GASKET MATERIAL SPECIFICATIONS

RUBBER SHEET PRODUCTS:	COMMERCIAL NEOPRENE	COMMERCIAL BUNA	WHITE FDA NITRILE
<i>APPLICATIONS:</i>	GOOD OIL/GAS RESIST GOOD FOR BUMPERS, PADS & SEALING, RESISTS ROT, CHECKING & CRACKING	GOOD RESISTANCE TO OILS & AROMATIC FUELS SUPERIOR CHEMICAL RESISTANCE GOOD RESISTANCE TO BOTH OIL & WATER	GOOD FOR ALL TYPES OF FOOD PROCESSING PHARMACEUTICAL AND COSMETIC PRODUCTS RESISTANT TO OILY & GREASY FOODS, NON-TOXIC NON-MARKING, NON-ALLERGENIC
COLOR:	BLACK	BLACK	WHITE
THICKNESS (INCHES):	1/32 - 2	1/32 - 1	1/16 - 1/4
DUROMETER HARDNESS /SHORE A+/- 5:	60	60	60
TENSILE:	1300	900	1000
ELONGATION:	500	300	650
TEMPERATURE MAX:	170 F	170 F	220 F
WEIGHT PER LINEAL FOOT(36" WIDE):	1/8 - 2.7	1/8 - 2.6	1/8 - 2.8
FINISH:	SMOOTH	SMOOTH	SMOOTH
SPECIFICATIONS:	-ASTM D-2000-86e -SAE J200, 1 BC 609 -MIL R-3065, SC 609	-ASTM D-2000-86e -SAE J200, 1 BE 609	FDA APPROVED/ NON-TOXIC NON-ALLERGENIC/ NON-MARKING GOOD OIL RESISTANCE

APPLICATIONS:	RED RUBBER	COMMERCIAL EPDM	CLOTH INSERTED RUBBER
<i>APPLICATIONS:</i>	RECOMMENDED FOR LOW PRESSURE- HEATING & PLUMBING (LOW COST) AGING, ABRASION & TEAR RESISTANCE CONFORMS TO UNEVEN FLANGE SURFACES	EXCELLENT FOR EXTREME TEMP / WEATHER OZONE & CHEMICAL RESIST. EXCELLENT ELECTRICAL & DYNAMIC PROP'S EXCELLENT RESISTANCE TO HIGH TEMP, ANIMAL & VEG OILS, STEAM & OXYGENATED SOLVENTS	EXCELLENT FOR AIR, HOT & COLD WATER, SATURATED STEAM, LOW PRESSURE HYDRAULIC -EXCELLENT FOR CUSTOM CUTTING & OFF-SIZE APPLICATIONS
COLOR:	RED	BLACK	BLACK
THICKNESS (INCHES):	1/8 - 3.5	1/16 - 1/4	1/16 - 1/4
DUROMETER HARDNESS /SHORE A+/- 5:	75	60	65
TENSILE:	600	1000	400
ELONGATION:	200	500	200
TEMPERATURE MAX:	170 F	220 F	170 F
WEIGHT PER LINEAL FOOT(36" WIDE):	1/8 - 3.5	1/8 - 2.2	N/A
FINISH:	FABRIC FINISH	SMOOTH	SMOOTH
SPECIFICATIONS:	ASTM D-1330-66 CLASS II ASTM D-2000 TYPE AA	-ASTM D-2000-86e -SAE J200, 3BA (608, 708), C12 -MIL R-3065 -RS 608, C12	FABRIC WEIGHT: 4 OZ FABRIC TYPE: POLYESTER OIL RESISTANCE: NONE

SPECIALTY SHEET PRODUCTS:	SOFT-CHEM	GRAPHOIL	 CAIN BOLT & GASKET, INC	
<i>CHARACTERISTICS & APPLICATIONS:</i>	EXCELLENT RESISTANCE TO CHEMICALS, MOSTLY UNAFFECTED BY STEAM FIBROUS STRUCTURE HIGH COMPRESSIBILITY EXCELLENT CORROSION RESISTANCE & IMPERMEABILITY	-ASBESTOS-FREE, NO FIBERS, BINDERS OR ADDITIVES IMPERMEABLE TO GASES & LIQUIDS, RESISTS THERMAL SHOCK, EXC. SEALABILITY DOES NOT AGE, SHRINK OR HARDEN, HIGHLY CHEMICAL RESISTANT		
		HOMOGENEOUS	TANG INSERTED (316SS)	
CREEP ASTM F38B 212 F:	35% (1/32")	0.05	0.1	
SEALABILITY ASTM F37B FUEL A:	.002 ml/min	----	----	
GAS LEAKAGE DIN 3535/6:	.02 ml/min	----	----	
HOT COMPRESSION:				
THICKNESS DECREASE AMBIENT 3625 psi	37%	----	----	
THICKNESS DECREASE 572 F	29%	----	----	
COMPRESSIBILITY ASTM F36J:	60%	45% (5000 psi)	35% (5000 psi)	
RECOVERY ASTM F36A:	12% min	20%(5000PSI)	18% (5000psi)	
TENSILE ASTM 152:	1500 psi	700 PSI	5000 psi	
VACUUM TO FULL PRESSURE:	3000 psi	----	----	
CHEMICAL RESISTANCE:	0 - 14 ph	0 - 14 ph	0 - 14 ph	
DENSITY:	.85 g/cm3	62.4 lbs/ft3	62.4 lb/ft	
TEMPERATURE MAX:	500 F	900 F (in air)	900 F (in air)	
PRESSURE MAX:	3000 psi	1200 F (in steam)	1800 F (inert media)	
TESTED BY ECOLE POLYTECHNIC (1/16"):		2000 psi	2000 psi	
Gb psi	1260	98% minimum	98% minimum	
a	0.2	1200 ppm max	1200 ppm max	
GS psi	3.5	50 ppm max	50 ppm max	
			CARBON TOTAL SULFUR LEACHABLE CHLORIDES	



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GASKET INSTALLATION PROCEDURES AND LEAKS

I. Installation Procedure:

To obtain a satisfactory seal, it is necessary that basic procedures are followed during installation. These procedures are of fundamental importance for a successful operation no matter what style of gasket or material used.

a) Inspect the flange sealing surface. Check for tool marks, dents, scratches or corrosion. Radial tool marks on the sealing surface are difficult to seal regardless of the style of gasket. Be sure that the finish is adequate for the style of gasket being used.

b) Inspect the gasket. Verify to be sure the gasket material is compatible with the intended service. Check for defects and shipping or storage damage and tool marks on solid gaskets.

c) Inspect and clean bolts, nuts, and washers.

d) Lubricate bolt threads and the nut contact surfaces. Do not install bolts and nuts without lubrication. The lubricant should be compatible with the service temperature.

e) For raised or flat faced flanges installed vertically, installation is started by the bolts on the lower part. Install the gasket then the other bolts.

f) For male and female or tongue and groove flanges, the gasket should be installed in the center of the groove.

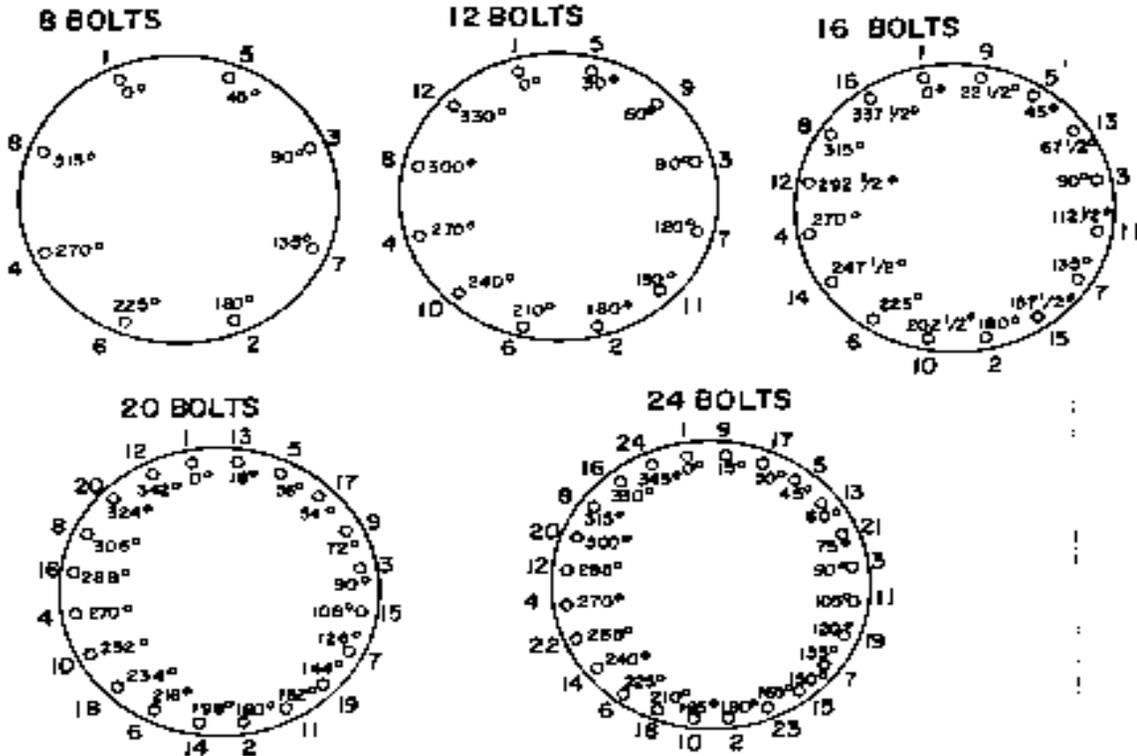
g) Tighten the bolts approximately 30% of the final torque following the sequence shown in the below diagrams for the different types of flanges. Number the screws to facilitate following the tightening order. If the correct tightening sequence is not followed, the flanges may be misaligned, making it impossible to have a uniform seating of the gasket.

h) Repeat step g, elevating the torque from 50% to 65% of the final value.

i) Continue tightening in the recommended sequence until the final value is reached. The same bolt normally has to be tightened more than once.

j) All gaskets relax after seating. Retightening is recommended 24 hours after installation to compensate for the relaxation.

II. Tightening Sequence:





CAIN BOLT & GASKET, INC.

III. Torque Values:

The most correct method for obtaining the correct seating stress is to apply the bolt load by direct measuring its tension. However, in practice, this procedure is cumbersome and of difficult execution. If direct tension measuring is not possible, it is recommended to use a torque wrench or hydraulic tools. The use of manual tools without torque control is acceptable only in non-critical applications.

IV. Allowable Bolt Stress:

The ASME Pressure Vessel and Boiler Code, Section VIII, Appendix S specifically deals with the bolt stress. For example, the designer of the flange should determine the necessary tightening for the temperature and pressure in specific operational conditions according to the allowable bolt stress at the operating temperature.

Hydrostatic testing, which in the majority of cases is necessary to verify the system, is done at one and a half times the operational pressure. Consequently, a flanged joint designed in accordance with the ASME Code, which should be hydrostatic tested with a pressure higher than the design pressure, has to be tightened for the test.

The ASME Pressure Vessel and Boiler Code, Section VIII, Appendix S established that in order to pass the hydrostatic test, the bolts must be tightened up to the torque necessary for that purpose. If, in this case, the tension is greater than what is admissible, bolts made with a higher allowable tension material should be used observing the following procedure:

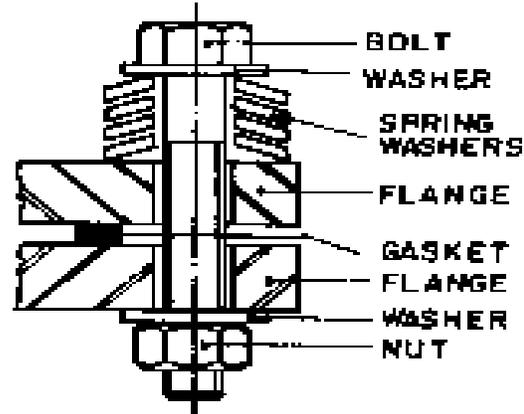
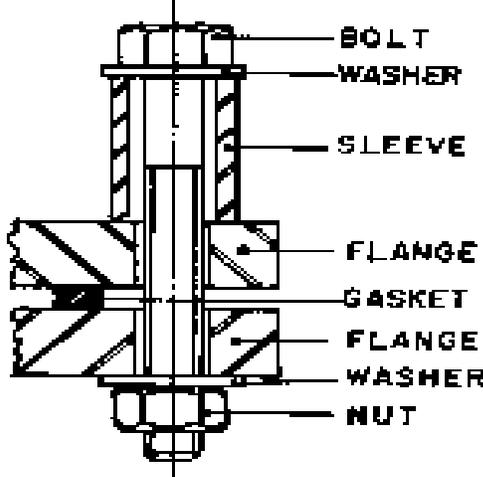
- Use bolts with allowable tension compatible with the one necessary to pass the hydrostatic test, following the normal installation procedure for the gasket.
- After the hydrostatic test is completed, loosen the bolts approximately 50% of the initial tension.
- Replace the bolts used for the test with the originally designed bolts, one at a time, tightening until reaching the torque of the other bolts.
- After replacing all bolts, tighten them up to the design torque following the recommended sequence.

V. Thermal Growth:

When the bolts are tightened to resist the existing forces of the system, care should be taken with tensions caused by different thermal growth coefficients of the materials and by the temperature gradient in the flanges and bolts.

Whenever thermal growth is a serious problem it is recommended that the gasket be seated up to a point to allow an additional seating when the operational temperature is reached.

The use of longer bolts or spring washers as shown below is also recommended.





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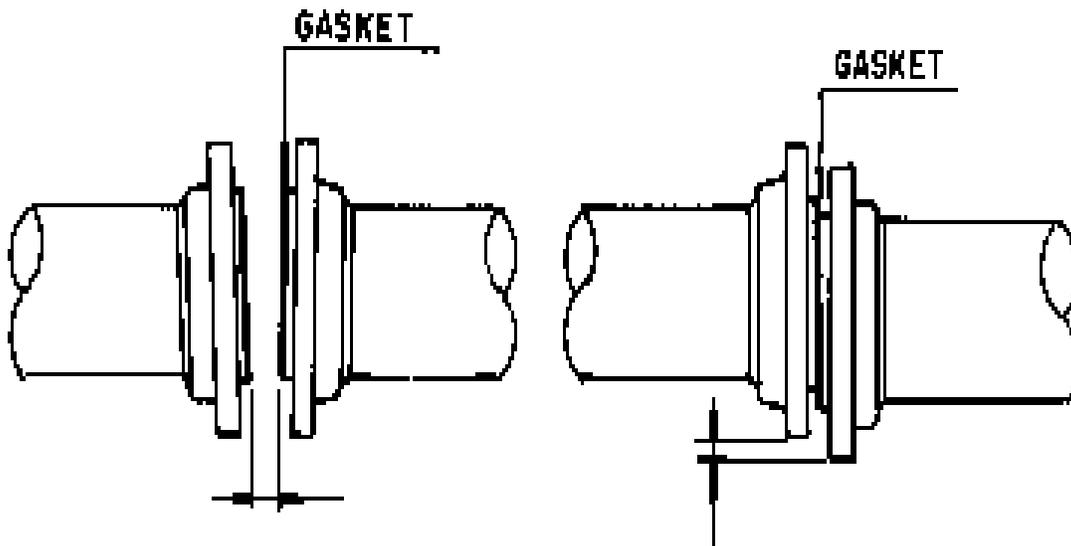
VI. Leakage:

One of the most efficient ways to analyze the causes of leakage is to carefully analyze the gasket used when such a leakage has taken place as shown below.

- A very corroded gasket: select a material with better corrosion resistance.
- A very extruded gasket: select a material with a better cold flow resistance or with a higher seating stress, use a compression limiter ring or redesign the flanges.
- Gasket with a damaged sealing surface: verify the gasket and flange dimensions. It could be that the gasket has the inside diameter smaller than the inside diameter of the flange or the outside diameter of the gasket is larger than the outside diameter of the flange.
- Gasket not seated: select a softer gasket or reduce that contact area between gasket and flange.
- Gasket thinner at the outside diameter: indication of a "rotation" or flange deflection. Change the gasket dimensions in a way that it fits closer to the bolts to reduce the rotational torque. Select a softer gasket that requires a lower seating stress. Reduce the area of the gasket. Reinforce the flange to increase its rigidity.
- Gasket irregularly seated: incorrect procedure in tightening the bolts. Make sure the tightening sequence of the bolts is followed properly.
- Gasket with regularly varying thickness: indication of flanges with excessive distance between bolts or without sufficient rigidity. Reinforce the flanges, reduce the distance between bolts or select a softer gasket.

VII. Misaligned Flanges:

When the flanges are not aligned, as shown below, it is not recommended to align them by tightening the bolts. Misalignments must be corrected.





CAIN BOLT & GASKET, INC

OLD STANDARD/ NEW STANDARD PIPING GASKET SPECS/ RINGS, FULL FACE

NOTE: OLD STD AND NEW STD OD'S ARE THE SAME

PIPE SIZE & OLD STD. I.D.	125-150# RING	
	NEW STD. ASA I.D. X O.D.	
1/2	27/32 X 1-7/8	
3/4	1-1/16 X 2-1/4	
1	1-5/16 X 2-5/8	
1-1/4	1-21/32 X 3	
1-1/2	1-29/32 X 3-3/8	
2	2-3/8 X 4-1/8	
2-1/2	2-7/8 X 4-7/8	
3	3-1/2 X 5-3/8	
4	4-1/2 X 6-7/8	
5	5-9/16 X 7-3/4	
6	6-5/8 X 8-3/4	
8	8-5/8 X 11	
10	10-3/4 X 13-3/8	
12	12-3/4 X 16-1/8	
14	14 X 17-3/4	
16	16 X 20-1/4	
18	18 X 21-5/8	
20	20 X 23-7/8	
22	22 X 26	
24	24 X 28-1/4	
26	26 X 30-1/2	
28	28 X 32-3/4	
30	30 X 34-3/4	
32	32 X 37	
34	34 X 39	
36	36 X 41-1/4	
38	38 X 43-5/8	
40	40 X 45-5/8	
42	42 X 48	
44	44 X 50-1/8	
46	46 X 52-1/8	
48	48 X 54-1/2	

PIPE SIZE & OLD STD. I.D.	125-150# FULL FACE			
	NEW STD. ASA I.D. X O.D.	NO. HOLES	DIA. HOLES	BOLT CIRCLE
1/2	27/32 X 3-1/2	4	5/8	2-3/8
3/4	1-1/16 X 3-7/8	4	5/8	2-3/4
1	1-5/16 X 4-1/4	4	5/8	3-1/8
1-1/4	1-21/32 X 4-5/8	4	5/8	3-1/2
1-1/2	1-29/32 X 5	4	5/8	3-7/8
2	2-3/8 X 6	4	3/4	4-3/4
2-1/2	2-7/8 X 7	4	3/4	5-1/2
3	3-1/2 X 7-1/2	4	3/4	6
4	4-1/2 X 9	8	3/4	7-1/2
5	5-9/16 X 10	8	7/8	8-1/2
6	6-5/8 X 11	8	7/8	9-1/2
8	8-5/8 X 13-1/2	8	7/8	11-3/4
10	10-3/4 X 16	12	1	14-1/4
12	12-3/4 X 19	12	1	17
14	14 X 21	12	1-1/8	18-3/4
16	16 X 23-1/2	16	1-1/8	21-1/4
18	18 X 25	16	1-1/4	22-3/4
20	20 X 27-1/2	20	1-1/4	25
22	22 X 29-1/2	20	1-1/4	27-1/4
24	24 X 32	20	1-3/8	29-1/2
26	26 X 34-1/4	24	1-3/8	31-3/4
28	28 X 36-1/2	28	1-3/8	34
30	30 X 38-3/4	28	1-3/8	36
32	32 X 41-3/4	28	1-5/8	38-1/2
34	34 X 43-3/4	32	1-5/8	40-1/2
36	36 X 46	32	1-5/8	42-3/4
38	38 X 48-3/4	36	1-5/8	45-1/4
40	40 X 50-3/4	36	1-5/8	47-1/4
42	42 X 53	36	1-5/8	49-1/2
44	44 X 55-1/4	40	1-5/8	51-3/4
46	46 X 57-1/4	40	1-5/8	53-3/4
48	48 X 59-1/2	44	1-5/8	56

NOTE: OLD STD AND NEW STD OD'S ARE THE SAME

PIPE SIZE & OLD STD. I.D.	250-300 # RING	
	NEW STD. ASA I.D. X O.D.	
1/2	27/32 X 2-1/8	
3/4	1-1/16 X 2-5/8	
1	1-5/16 X 2-7/8	
1-1/4	1-21/32 X 3-1/4	
1-1/2	1-29/32 X 3-3/4	
2	2-3/8 X 4-3/8	
2-1/2	2-7/8 X 5-1/8	
3	3-1/2 X 5-7/8	
4	4-1/2 X 7-1/8	
5	5-9/16 X 8-1/2	
6	6-5/8 X 9-7/8	
8	8-5/8 X 12-1/8	
10	10-3/4 X 14-1/4	
12	12-3/4 X 16-5/8	
14	14 X 19-1/8	
16	16 X 21-1/4	
18	18 X 23-1/2	
20	20 X 25-3/4	
22	22 X 27-3/4	
24	24 X 30-1/2	
26	26 X 32-7/8	
28	28 X 35-3/8	
30	30 X 37-1/2	
32	32 X 39-5/8	
34	34 X 41-5/8	
36	36 X 44	
38	38 X 46-1/8	
40	40 X 48-3/4	
42	42 X 50-3/4	
44	44 X 53	
46	46 X 55-1/4	
48	48 X 58-3/4	

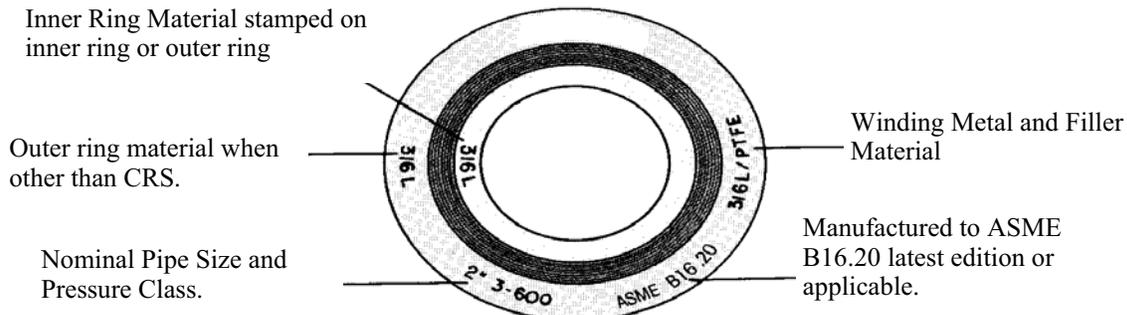
PIPE SIZE & OLD STD. I.D.	250-300 # FULL FACE			
	NEW STD. ASA I.D. X O.D.	NO. HOLES	DIA. HOLES	BOLT CIRCLE
1/2	27/32 X 3-3/4	4	5/8	2-5/8
3/4	1-1/16 X 4-5/8	4	3/4	3-1/4
1	1-5/16 X 4-7/8	4	3/4	3-1/2
1-1/4	1-21/32 X 5-1/4	4	3/4	3-7/8
1-1/2	1-29/32 X 6-1/8	4	7/8	4 1/2
2	2-3/8 X 6-1/2	8	3/4	5
2-1/2	2-7/8 X 7-1/2	8	7/8	5-7/8
3	3-1/2 X 8-1/4	8	7/8	6-5/8
4	4-1/2 X 10	8	7/8	7-7/8
5	5-9/16 X 11	8	7/8	9-1/4
6	6-5/8 X 12-1/2	12	7/8	10-5/8
8	8-5/8 X 15	12	1	13
10	10-3/4 X 17-1/2	16	1-1/8	15-1/4
12	12-3/4 X 20-1/2	16	1-1/4	17-3/4
14	14 X 23	20	1-1/4	20-1/4
16	16 X 25-1/2	20	1-3/8	22-1/2
18	18 X 28	24	1-3/8	24-3/4
20	20 X 30-1/2	24	1-3/8	27
22	22 X 33	24	1-3/8	29-1/4
24	24 X 36	24	1-5/8	32
26	26 X 38-1/4	28	1-5/8	34-1/2
28	28 X 40-3/4	28	1-5/8	37
30	30 X 43	28	1-7/8	39-1/4
32	32 X 45-1/4	28	1-7/8	41-1/2
34	34 X 47-1/2	28	1-7/8	43-1/2
36	36 X 50	32	2-1/8	46
38	38 X 52-1/4	32	2-1/8	48
40	40 X 54-1/4	36	2-1/8	50-1/4
42	42 X 57	36	2-1/8	52-3/4
44	44 X 59-1/4	36	2-1/8	55
46	46 X 61-1/2	40	2-1/8	57-1/4
48	48 X 65	40	2-1/8	60-3/4



CAIN BOLT & GASKET, INC SPIRAL WOUND GASKETS

AVAILABLE GASKET MATERIALS		
METAL WINDING STRIP	FILLER MATERIAL	GUIDE RING MATERIAL
AS STANDARD Stainless Steel type 316l 304	AS STANDARD Non Asbestos	AS STANDARD Carbon Steel
OTHERS	OTHERS	OTHERS
Stainless Steel type 304L 309 310 316Ti 321 347 430 17-7PH	Graphoil Asbestos Paper PTFE Ceramic Graphoil has been carefully researched and developed to meet industry's demand for a superior alternative to asbestos filler in spiral wound gaskets. Graphoil provides performance that is superior to asbestos, and has been field proven through years of actual service in critical applications throughout the world. Graphoil is pure graphite and is manufactured without the use of fillers, resins or binders that could deteriorate at elevated temperatures. Graphoil is also available in the following products to meet all your sealing needs: Bulk rolls, sheets, reinforced sheets, gasket tape and tape packing, and cut gaskets.	Stainless Steel Type 304 304L 316 316L 316Ti 310 321 347 410 INCONEL 600 625 MONEL TITANIUM NICKEL INCOLOY 825 HASTELLOY B-2 C276
ALLOY 20 MONEL TITANIUM NICKEL 200 INCONEL 600 625 X-750 HASTELLOY B2 C276 INCOLOY 800 825 DUPLEX ZIRCONIUM TANTALUM COPPER PHOS-BRONZE CARBON STEEL	NOTE: Materials should be selected with regard to operating temperature and chemical compatibility. PTFE: If subjected to temperatures above 250C (500F) decomposition starts to occur slowly, increasing rapidly above 400C (750F). Care should be taken to avoid inhaling the resultant fumes, which may produce unpleasant effects.	

API STAMPING REQUIREMENTS





CAIN BOLT & GASKET, INC

ENGINEERING DATA: BOLTS, STUDS, AND NUTS

Materials sold by Cain Bolt & Gasket are manufactured from quality materials meeting the physical and chemical requirements of both The American Society for Testing and Materials (ASTM) and The American Society of Mechanical Engineers (ASME). These quality controlled materials are normally used by the petroleum, petrochemical and process industries in valves, flanges, piping systems, pressure vessels, etc.

The design codes used by the various industries specify the bolting requirements by ASTM or ASME designations and give the limitations of each. Selection of a bolting material will normally be governed by design requirements, service conditions, desired mechanical properties and temperature characteristics. The following is a partial listing, by specification, of the most commonly used bolting materials:

ASTM A-193/ASME SA-193 - "STANDARD SPECIFICATION FOR ALLOY-STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH TEMPERATURE SERVICE"

Identification Symbol	AISI TYPE	Outstanding Chemical
B-5	501	5% Chromium
B-6	410	12% Chromium
B-6X	410	12% Chromium
B-7	4140-4142-4145	Chromium-Molybdenum
B-7M	4140-4142.4145	Chromium-Molybdenum
B-16		Chromium-Molybdenum-Vanadium
B-8, B8A	304	18 Chromium-8 Nickel
B-8C, B8CA	347	18 Chromium-8 Nickel, Stabilized
B-8M, B8MA	316	18 Chromium-8 Nickel-2 Molybdenum
B-8T, B8TA	321	18 Chromium-8 Nickel, Stabilized

The most commonly used Ferritic steel stud grades are Grade B7 and Grade B7M, which are normally used from -50 F. to 1000 F., and Grade B16, which are normally used from -50 F to 1100 F. These types are stock items, with the other listed grades available on a special order basis. The most commonly used Austenitic steel studs are Grade B8 and Grade B8M, in both the Class 1 (Carbide Solution Treated) and Class 2 (Carbide Solution Treated and Strain-Hardened) conditions. These Austenitic steel grades are stocked, with the others available on a special order basis. The Austenitic group of steels are normally used in service temperatures from -325 F. to 1500 F.

ASTM A-320/ASME A-320 - "STANDARD SPECIFICATION FOR ALLOY STEEL BOLTING MATERIALS FOR LOW-TEMPERATURE SERVICE."

Identification Symbol	AISI TYPE	Outstanding Chemical
Ferritic L-7	4140-4142-4145	Chromium-Molybdenum
L-7M	4140-4142-4145	Chromium-Molybdenum
L-7A	4037	Molybdenum
L-7B	4137	Chromium-Molybdenum
L-7C	8740	Nickel-Chromium-Molybdenum
L-43	4340	Nickel-Chromium-Molybdenum
Austenitic B-8, B-8A	304	Unstabilized 18 Chromium -8 Nickel
B-8C, B-8CA	847	Stabilized 18 Chromium-8 Nickel
B-8M, B-8MA	316	18 Chromium-8 Nickel-2 Molybdenum
B-8F, B-8FA	321	Stabilized 18 Chromium-8 Nickel
B-8F, B-8FA	303	Free Machining 18 Chromium-8 Nickel



CAIN BOLT & GASKET, INC

The Ferritic steel Grades L7 and L7M together with the Austenitic Grades B8 and B8M are normally stocked for immediate shipment, with the other Grades available on special order. Grade L7 is normally used to 500F without a Charpy Test and to -150 F with a Charpy Test. Grade L7M is normally used In H₂S service with a required Charpy Test at -100⁰F. All of the Austenitic steels listed above may be used to -325 ⁰F without a Charpy Innpact Test and at lower temperatures with the requisite Impact Tests.

ASTM A-194/ ASME SA-194 -- - "STANDARD SPECIFICATION FOR CARBON AND ALLOY STEEL NUTS FOR BOLTS FOR HIGH-PRESSURE AND HIGH-TEMPERATURE SERVICE."

Identification Symbol	AISI Type	Outstanding Chemical	Brinell Hardness
Ferritic 2-M		Carbon	159 to 287
2-H		Carbon	248 to 352
4		Carbon-Molybdenum	248 to 352
3	501	8% Chromium	248 to 352
6	410	12% Chromium	228 to 271
6-F	416	12% Chromium	228 to 271
7	4140-4145	Chromium-Molybdenum	248 to 352
Austenitic 8	304	18 Chromium-8 Nickel	126 to 300
8-C	347	18 Chromium-B Nickel	126 to 300
8-M	316	18 Chromium-8 Nickel-2 Molybdenum	126 to 300
8-T		321	18
Chromium-8 Nickel	126 to 300		
8-F		303	18
Chromium-8 Nickel	126 to 300		
8-P		308	18
Chromium-10 Nickel	126 to 800		

Ferritic steel nuts are manufactured In Grades 2H, 2M and 7, which are normally used in conjunction with Grade B7, B7M, B16, L7 and L7M studs. The Austenitic steel nuts, Grade 8 and 8M are also available from stock for use on stainless steel studs and bolts. Heavy pattern hex nuts are available in the grades listed above to the dimensional requirements of ANSI B18.2.2. Unless otherwise specified, these nuts are tapped 8UNC-2B in sizes 1” and under, and 8UN-2B over 1” diameter. All other grades of nuts listed may require special order.



CAIN BOLT & GASKET, INC

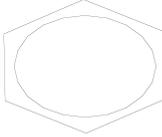
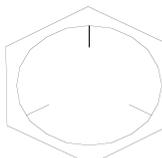
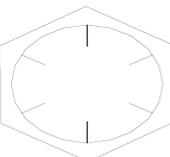
CHEMICAL AND MECHANICAL PROPERTIES OF NUTS AND BOLTS

	ASTM Spec Grade	AISI Mat'l	Mechanical Properties										Hardness HB		
			C	Si	Mn	P	S	Ni	Cr	Mo	Others	0.2% Yield Strength psi		Tensile Strength psi	Elongation %
STUB	A193	B5	min 0.10	max 1.00	max 1.00	max 0.040	max 0.030		4.00-6.00	0.40-0.65		min 80000	min 100000	min 16	min 50
		B6	max 0.15	max 1.00	max 1.00	max 0.040	max 0.030	11.50-13.50			min 85000	min 110000	min 15	min 50	
		B7	0.38-0.48	0.20-0.35	0.75-1.00	max 0.040	max 0.040	0.80-1.10			min 105000*	min 125000*	min 16*	min 50*	
		B16	0.36-0.44	0.20-0.35	0.45-0.70	max 0.040	max 0.040	0.80-1.15		V:0.25-0.35	min 105000*	min 125000*	min 18*	min 50*	
		A320	L7	0.38-0.48	0.20-0.35	0.75-1.00	max 0.040	max 0.040	0.80-1.10	0.15-0.25		min 105000*	min 125000*	min 16*	min 50*
			L7A	0.35-0.40	0.20-0.35	0.70-0.90	max 0.040	max 0.040	0.20-0.30	0.15-0.25		min 105000	min 125000	min 16	min 50
			L7B	0.35-0.40	0.20-0.35	0.70-0.90	max 0.040	max 0.040	0.80-1.10	0.15-0.25		min 105000	min 125000	min 16	min 50
			L7C	0.38-0.43	0.20-0.35	0.75-1.00	max 0.035	max 0.040	0.40-0.60	0.20-0.35		min 105000	min 125000	min 16	min 50
			L43	0.38-0.43	0.20-0.35	0.60-0.85	max 0.040	max 0.040	0.70-0.90	0.20-0.30		min 105000	min 125000	min 16	min 50
		A193/A320	B8	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	18.00-20.00	0.40-0.65		min 30000	min 75000	min 30	min 50
NUT		B8C	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	17.00-19.00	0.40-0.65		min 30000	min 75000	min 30	min 50	
		B8M	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	16.00-12.00	2.00-3.00		min 30000	min 75000	min 30	min 50	
		B8T	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	10.00-14.00	2.00-3.00		min 30000	min 75000	min 30	min 50	
		A453	660	max 0.08	max 1.00	max 2.00	max 0.040	max 0.030	13.00-16.00	1.00-1.50	Cb +Ta: 10 x C% Ti: 5 X C% V: 0.10-0.50 Ti: 0.1-0.35 W: 1.0-1.75 Ti: 0.1-0.35 Cu: max 0.50	min 85000	min 130000	min 15	min 18
			651	0.28-0.35	0.30-0.80	0.75-1.50	max 0.040	max 0.030	18.00-21.00	1.00-1.75		min 50000**	min 95000	min 18**	min 35**
		A194	3	min. 0.10	max 1.00	max 1.00	max 0.040	max 0.030	4.00-6.00	0.40-0.65					
			6	max 0.15	max 1.00	max 1.50	max 0.060	max 0.150	12.00-14.00	max 0.60					
			2H	min 0.40	min 0.40	0.70-0.90	max 0.040	max 0.050			Zr: max 0.60				
			4	0.40-0.50	0.20-0.35	0.70-0.90	max 0.035	max 0.040	0.80-1.10	0.20-0.35					
			7	0.38-0.48	0.20-0.35	0.70-1.00	max 0.040	max 0.040	8.00-1.10	0.15-0.25					
TUN	A194	8	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	8.00-12.00	2.00-3.00						
		8C	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	9.00-13.00	2.00-3.00						
		8M	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	10.00-14.00	2.00-3.00						
		8T	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	9.00-12.00	2.00-3.00						



CAIN BOLT & GASKET, INC

MECHANICAL REQUIREMENTS FOR STEEL BOLTS

Grade & Head Marking	Nom. Bolt Size Diam. In.	Coarse Thread		Fine Thread		Hardness		Material and Strength in P.S.I	
		Proof Load Lb.	Tensile Strength Min. Lb.	Proof Load Lb.	Tensile Strength Min. Lb.	Brinnell	Rockwell		
SAE GRADE 2 	1/4	1.750	2.200	2.000	2.500	241 max	100 B max.	Low Carbon Steel. Up to 1/2 inch, Proof Load Minimum 55,000 psi, Tensile Strength Minimum 69,000 psi. Over 1/2 inch to 3/4 inch Proof Load Minimum 52,000 psi, Tensile Strength Minimum 64,000. Over 3/4 inch to 1-1/2 inch Proof Load Minimum 28,000 psi. Tensile Strength Minimum 55,000 psi.	
	5/16	2.900	3.600	3.200	4.000	241 max	100 B max.		
	3/8	4.250	5.350	4.850	6.050	241 max	100 B max.		
	7/16	5.850	7.350	6.550	8.200	241 max	100 B max.		
	1/2	7.800	9.800	8.800	11.050	241 max	100 B max.		
	9/16	9.450	11.650	10.550	13.000	241 max	100 B max.		
	5/8	11.750	14.450	13.300	16.400	241 max	100 B max.		
	3/4	17.350	21.400	19.400	23.850	241 max	100 B max.		
	7/8	12.900	25.400	14.250	28.000	207 max	95 B max.		
	1	16.950	33.350	18.550	36.450	207 max	95 B max.		
	1 1/8	21.350	41.950	23.950	47.100	207 max	95 B max.		
	1 1/4	27.100	53.300	29.950	59.000	207 max	95 B max.		
	1 3/8	32.300	63.550	36.800	72.350	207 max	95 B max.		
	1 1/2	39.300	77.300	44.000	86.950	207 max	95 B max.		
SAE GRADE 5 OR ASTM A-325 	1/4	2.700	3.800	3.100	4.350	241- 302	23-32	C	Medium Carbon Steel. Quenched and Tempered. Up to 3/4 inch Proof Load Minimum 85,000 psi, Tensile Strength Minimum 120,000 psi. Over 3/4 inch to 1 inch, Proof Load Minimum 78,000 psi, Tensile Strength Minimum 115,000 psi. Over 1 inch to 1-1/2, Proof Load Minimum 74,000 psi, Tensile Strength Minimum 105,000 psi. ASTM-A325 Over 1-1/2 inch to 3 inch Proof Load Minimum 55,000 psi, Tensile Strength Minimum 90,000 psi.
	5/16	4.450	6.300	4.950	6.950	241- 302	23-32	C	
	3/8	6.600	9.300	7.450	10.550	241- 302	23-32	C	
	7/16	9.050	12.750	10.100	14.250	241- 302	23-32	C	
	1/2	12.050	17.050	13.600	19.200	241- 302	23-32	C	
	9/16	15.450	21.850	17.250	24.350	241- 302	23-32	C	
	5/8	19.200	27.100	21.750	30.700	241- 302	23-32	C	
	3/4	28.400	40.100	31.700	44.750	241- 302	23-32	C	
	7/8	36.050	53.150	39.700	58.550	235- 302	22-32	C	
	1	47.250	69.700	51.700	76.250	235- 302	22-32	C	
	1 1/8	56.450	80.100	63.350	89.900	223- 285	19-30	C	
	1 1/4	71.700	101.750	79.400	112.650	223- 285	19-30	C	
	1 3/8	85.450	121.300	97.300	138.100	223- 285	19-30	C	
	1 1/2	103.950	147.550	117.000	166.000	223- 285	19-30	C	
SAE GRADE 8 OR ASTM A-354 GRADE BD ASTM-A490 	1/4	3.800	4.750	4.350	5.450	302- 352	32-38	C	Medium Carbon Alloy ² Steel Quenched and Tempered. Up to 1-1/2 inch Proof Load Minimum 120,000 psi, Tensile Strength Minimum 150,000 psi.
	5/16	6.300	7.850	6.950	8.700	302- 352	32-38	C	
	3/8	9.300	11.650	10.550	13.150	302- 352	32-38	C	
	7/16	12.750	15.950	14.250	17.800	302- 352	32-38	C	
	1/2	17.050	21.300	19.200	24.000	302- 352	32-38	C	
	9/16	21.850	27.300	24.350	30.450	302- 352	32-38	C	
	5/8	27.100	33.900	30.700	38.400	302- 352	32-38	C	
	3/4	40.100	50.100	44.750	55.950	302- 352	32-38	C	
	7/8	55.450	69.300	61.100	76.350	302- 352	32-38	C	
	1	72.700	90.900	79.550	99.450	302- 352	32-38	C	
	1 1/8	91.550	114.450	102.700	128.400	302- 352	32-38	C	
	1 1/4	116.300	145.350	128.750	160.950	302- 352	32-38	C	
	1 3/8	138.600	173.250	157.800	197.250	302- 352	32-38	C	
	1 1/2	168.600	210.750	189.700	237.150	302- 352	32-38	C	

1 Grade 5 material heat treated before assembly with a hardened washer is an acceptable substitute.
 2 Carbon steel may be used by agreement between producer and consumer in size 1/4 thru 3/4 inch. NOTE: Carbon range is for check analysis of product.



CAIN BOLT & GASKET, INC

BOLT SIZING

American Water Works Association (AWWA)

150# Flange Size	Qty Per Set	Bolt Size	250# Flange Size	Qty Per Set	Bolt Size
1/2, 3/4, 1	4	1/2-13 x 1 3/4	1	4	5/8-11 x 2 1/2
1 1/4	4	1/2-13 x 2	1 1/4	4	5/8-11 x 2 1/2
1 1/2	4	1/2-13 x 2	1 1/2	4	5/8-11 x 2 3/4
2	4	5/8-11 x 2 1/4	2	8	5/8-11 x 2 3/4
2 1/2	4	5/8-11 x 2 1/2	2 1/2	8	3/4-10 x 3 1/4
3	4	5/8-11 x 2 1/2	3	8	3/4-10 x 3 1/2
3 1/2	8	5/8-11 x 2 3/4	3 1/2	8	3/4-10 x 3 1/2
4	8	5/8-11 x 3	4	8	3/4-10 x 3 3/4
5	8	3/4-11 x 3	5	8	3/4-10 x 4
6	8	3/4-11 x 3 1/4	6	12	3/4-10 x 4
8	8	3/4-11 x 3 1/2	8	12	7/8-9 x 4 1/2
10	12	7/8-9 x 3 3/4	10	16	1-8 x 5 1/2
12	12	7/8-9 x 3 3/4	12	16	1 1/8-7 x 5 1/2
14	12	1-8 x 4 1/4	14	20	1 1/8-7 x 6
16	16	1-8 x 4 1/2	16	20	1 1/4-7 x 6
18	16	1 1/8-7 x 5	18	24	1 1/4-7 x 6 1/2
20	20	1 1/8-7 x 5	20	24	1 1/4-7 x 7
24	20	1 1/4-7 x 5 1/2	24	24	1 1/2-6 x 8
30	28	1 1/4-7 x 6 1/2	30	28	1 3/4-5 x 8 1/2
34, 36	32	1 1/2-6 x 7	36	32	2-4 1/2 x 9 1/2
42	36	1 1/2-6 x 7 1/2	42	36	2 - 4 1/2 x 10 1/2
48	44	1 1/2-6 x 8	48	40	2-4 1/2 x 11
54	44	1 3/4-5 x 8 1/2			
60	52	1 3/4-5 x 8 3/4			
72	60	1 3/4-5 x 9 1/2			
84	64	2-4 1/2 x 10 1/2			
96	68	2 1/4-4 1/2 x 11 1/2			



CAIN BOLT & GASKET, INC

BOLTING DATA FOR ASME/ANSI B16.5 FLANGES WITH HVY 2H NUTS

Nominal Pipe Size	150 LB FLANGES (3)					300 LB FLANGES (3)					400 LB FLANGES (4)			
	2H Nuts Wrench Size	No. of Bolts or Studs	Dia. of Bolts or Studs	Length of Bolts	Length of Studs	2H Nuts Wrench Size	No. of Bolts or Studs	Dia. of Bolts or Studs	Length of Bolts	Length of Studs	2H Nut Wrench Size	No. of Studs	Dia of Studs	Length of Studs
1/2	7/8	4	1/2	1-3/4	2-1/4	7/8	4	1/2	2	2-1/2	7/8	4	1/2	3
3/4	7/8	4	1/2	2	2-1/4	1-1/16	4	5/8	2-1/4	3	1-1/16	4	5/8	3-1/2
1	7/8	4	1/2	2	2-1/2	1-1/16	4	5/8	2-1/2	3	1-1/16	4	5/8	3-1/2
1-1/4	7/8	4	1/2	2-1/4	2-1/2	1-1/16	4	5/8	2-1/2	3-1/4	1-1/16	4	5/8	3-3/4
1-1/2	7/8	4	1/2	2-1/4	2-3/4	1-1/4	4	3/4	2-3/4	3-1/2	1-1/4	4	3/4	4-1/4
2	1-1/16	4	5/8	2-1/2	3-1/4	1-1/16	8	5/8	2-3/4	3-1/2	1-1/16	8	5/8	4-1/4
2-1/2	1-1/16	4	5/8	2-3/4	3-1/2	1-1/4	8	3/4	3-1/4	4	1-1/4	8	3/4	4-3/4
3	1-1/16	4	5/8	3	3-1/2	1-1/4	8	3/4	3-1/2	4-1/4	1-1/4	8	3/4	5
3-1/2	1-1/16	8	5/8	3	3-1/2	1-1/4	8	3/4	3-1/2	4-1/4	1-7/16	8	7/8	5-1/2
4	1-1/16	8	5/8	3	3-1/2	1-1/4	8	3/4	3-3/4	4-1/2	1-7/16	8	7/8	5-1/2
5	1-1/4	8	3/4	3	3-3/4	1-1/4	8	3/4	4	4-3/4	1-7/16	8	7/8	5-3/4
6	1-1/4	8	3/4	3-1/4	4	1-1/4	12	3/4	4	4-3/4	1-7/16	12	7/8	6
8	1-1/4	8	3/4	3-1/2	4-1/4	1-7/16	12	7/8	4-1/2	5-1/2	1-5/8	12	1	6-3/4
10	1-7/16	12	7/8	3-3/4	4-3/4	1-5/8	16	1	5-1/4	6-1/4	1-13/16	16	1-1/8	7-1/2
12	1-7/16	12	7/8	4	4-3/4	1-13/16	16	1-1/8	5-3/4	6-3/4	2	16	1-1/4	8
14	1-5/8	12	1	4-1/4	5-1/4	1-13/16	20	1-1/8	6	7	2	20	1-1/4	8-1/4
16	1-5/8	16	1	4-1/2	5-1/2	2	20	1-1/4	6-1/4	7-1/2	2-3/16	20	1-3/8	8-3/4
18	1-13/16	16	1-1/8	4-3/4	6	2	24	1-1/4	6-1/2	7-3/4	2-3/16	24	1-3/8	9
20	1-13/16	20	1-1/8	5	6-1/4	2	24	1-1/4	6-3/4	8-1/4	2-3/8	24	1-1/2	9-3/4
24	2	20	1-1/4	5-1/2	7	2-3/8	24	1-1/2	7-3/4	9-1/4	2-3/4	24	1-3/4	10-3/4

Nominal Pipe Size	600 LB FLANGES (4)				900 LB FLANGES (4)				1500 LB FLANGES (4)				2500 LB FLANGES (4)			
	2H Nut Wrench Size	No. of Studs	Dia of Studs	Length of Studs	2H Nut Wrench Size	No. of Studs	Dia of Studs	Length of Studs	2H Nut Wrench Size	No. of Studs	Dia of Studs	Length of Studs	2H Nut Wrench Size	No. of Studs	Dia of Studs	Length of Studs
1/2	7/8	4	1/2	3	1-1/4	4	3/4	4-1/4	1-1/4	4	3/4	4-1/4	1-1/4	4	3/4	4-3/4
3/4	1-1/16	4	5/8	3-1/2	1-1/4	4	3/4	4-1/2	1-1/4	4	3/4	4-1/2	1-1/4	4	3/4	5
1	1-1/16	4	5/8	3-1/2	1-7/16	4	7/8	5	1-7/16	4	7/8	5	1-7/16	4	7/8	5-1/2
1-1/4	1-1/16	4	5/8	3-3/4	1-7/16	4	7/8	5	1-7/16	4	7/8	5	1-5/8	4	1	6
1-1/2	1-1/4	4	3/4	4-1/4	1-5/8	4	1	5-1/2	1-5/8	4	1	5-1/2	1-13/16	4	1-1/8	6-3/4
2	1-1/16	8	5/8	4-1/4	1-7/16	8	7/8	5-3/4	1-7/16	8	7/8	5-3/4	1-5/8	8	1	7
2-1/2	1-1/4	8	3/4	4-3/4	1-5/8	8	1	6-1/4	1-5/8	8	1	6-1/4	1-13/16	8	1-1/8	7-3/4
3	1-1/4	8	3/4	5	1-7/16	8	7/8	5-3/4	1-13/16	8	1-1/8	7	2	8	1-1/4	8-3/4
3-1/2	1-7/16	8	7/8	5-1/2												
4	1-7/16	8	7/8	5-3/4	1-13/16	8	1-1/8	6-3/4	2	8	1-1/4	7-3/4	2-3/8	8	1-1/2	10
5	1-5/8	8	1	6-1/2	2	8	1-1/4	7-1/2	2-3/8	8	1-1/2	9-3/4	2-3/4	8	1-3/4	12
6	1-5/8	12	1	6-3/4	1-13/16	12	1-1/8	7-3/4	2-3/16	12	1-3/8	10-1/4	3-1/8	8	2	13-3/4
8	1-13/16	12	1-1/8	7-3/4	2-3/16	12	1-3/8	8-3/4	2-9/16	12	1-5/8	11-1/2	3-1/8	12	2	15-1/4
10	2	16	1-1/4	8-1/2	2-3/16	16	1-3/8	9-1/4	2-15/16	12	1-7/8	13-1/2	3-7/8	12	2-1/2	19-1/4
12	2	20	1-1/4	8-3/4	2-3/16	20	1-3/8	10	3-1/8	16	2	15	4-1/4	12	2-3/4	21-1/4
14	2-3/16	20	1-3/8	9-1/4	2-3/8	20	1-1/2	10-3/4	3-1/2	16	2-1/4	16-1/4				
16	2-3/8	20	1-1/2	10	2-9/16	20	1-5/8	11-1/4	3-7/8	16	2-1/2	17-3/4				
18	2-9/16	20	1-5/8	10-3/4	2-15/16	20	1-7/8	13	4-1/4	16	2-3/4	19-1/2				
20	2-9/16	24	1-5/8	11-1/2	3-1/8	20	2	13-3/4	4-5/8	16	3	21-1/2				
24	2-15/16	24	1-7/8	13	3-7/8	20	2-1/2	17-1/4	5-3/8	16	3-1/2	24-1/4				

NOTES:

- 1) All dimensions in inches.
- 2) Lengths include allowance for pull-up.
- 3) Length based on 1/16" raised face Welding Neck, Slip-On, Screwed or Blind Flanges. **For lap joint, add the thickness of both laps.**
- 4) Length based on 1/4" raised face Welding Neck, Slip-On, Screwed or Blind Flanges. For lap joint, add the thickness of both laps and subtract 1/2". For male and female or tongue and groove flange faces, subtract 1/4".

NON ASBESTOS SHEET AND GASKETS

CAIN BOLT & GASKET SUPPLIES MANY DIFFERENT STYLE NON-ASBESTOS GASKETS. HERE IS SUBMITTAL DATA AND SPECIFICATIONS ON OUR MOST COMMONLY USED MATERIALS.

MANUFACTURER :		GARLOCK		TEADIT		THERMOSEAL (KLINGER)	
STYLE #	2550	3000	NA1001	NA1100	C-4401		
BINDER	NITRILE	NITRILE	NITRILE	NITRILE	NITRILE		
COLOR :	GREEN	BLUE	GREEN	BLACK/GREY	GREEN		
TEMPERATURE :							
MAXIMUM :	+700 DEG F	+700 DEG F	+750 DEG F	+840 DEG F	+750 DEG F		
MINIMUM :	-40 DEG F	-40 DEG F	-40 DEG F	-40 DEG F			
CONTINUOUS MAX :	+400 DEG F	+400 DEG F					
PRESSURE(MAX) :	1000 PSIG	1000 PSIG	1370 PSI	1900 PSI	1450 PSI		
P X T (MAX) :	1/16"	350,000			400,000		
	1/8"	250,000					
TENSILE STRENGTH ACROSS GRAIN	1500 PSI	2250 PSI	1740 PSI	2460 PSI	2000 PSI		
ASTM F104 LINE CALL OUT	F712100A9B4E2K5M5	F712100A9B4E2K5M6	F712111B5E1IM5	F7131B4E22M6	F712121B3E22M5		
	GOOD FOR:	GOOD FOR:	GOOD FOR:	GOOD FOR:	GOOD FOR:		
	-WATER	-WATER	-MILD ORGANIC ACIDS	-MILD ORGANIC ACIDS	-MILD ORGANIC ACIDS		
	-HYDROCARBONS	-ALIPHATIC	-MILD INORGANIC ACIDS	-MILD INORGANIC ACIDS	-MILD INORGANIC ACIDS		
	-OILS	HYDROCARBONS	-CONCENTRATED ALKALIES	-CONCENTRATED ALKALIES	-CONCENTRATED ALKALIES		
	-GASOLINE	-OILS	-DILUTED ALKALIES	-DILUTED ALKALIES	-DILUTED ALKALIES		
		-GASOLINE	-WATER	-WATER	-WATER		
			-BRINE	-BRINE	-BRINE		
			-AIR	-AIR	-SATURATED STEAM		
			-INDUSTRIAL GASES	-INDUSTRIAL GASES	-INDUSTRIAL GASES		
			-OILS	-OILS	-OILS		
			-GENERAL CHEMICALS	-GENERAL CHEMICALS	-PETROLEUM		
			-ALIPHATIC SOLVENTS	-ALIPHATIC SOLVENTS	-GENERAL CHEMICALS		
			-AROMATIC SOLVENTS	-AROMATIC SOLVENTS	-ALIPHATIC SOLVENTS		
			-REFRIGERANTS	-REFRIGERANTS	-AROMATIC SOLVENTS		
			-PETROLEUM	-PETROLEUM	-CHLORINATED SOLVENTS		
					-OXYGENATED SOLVENTS		
					-REFRIGERANTS		

WE ALSO STOCK A WIDE VARIETY OF OTHER SPECIALTY NON-ASBESTOS PRODUCTS THAT ARE NOT LISTED HERE. IF YOU NEED HELP IN LOCATING SPECS OR OTHER INFORMATION, PLEASE FEEL FREE TO GIVE US A CALL AND WE WILL BE HAPPY TO HELP.

CAIN BOLT & GASKET INC. 7724-7TH. AVE. S. SEATTLE WA 98108
 PHONE (206)763-6460 TOLL FREE (800)340-1891 FAX (206)763-6878

PROPERTIES AND APPLICATION PARAMETERS SHOWN ARE TYPICAL AND ARE PRESENTED IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED. FAILURE TO PROPERLY USE GASKETING COULD RESULT IN SERIOUS INJURY OR DEATH.